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ABSTRACT

This chapter focuses on the innermost level of Bronfenbrenner's four-level conception of the human environmental ecology, namely the microsystem, and more specifically, the child's socialization in the family. Following discussion of concepts related to socialization, competence, and environmental ecology, selected research studies are reviewed to illuminate various factors within the family setting that may influence Chicano children's academic development. Such factors include the mother-child relationship, maternal teaching behaviors, mother's educational attainment, family size and sibling structure, socioeconomic status, home language, single parenting, home environmental processes (parent behaviors), and parent beliefs and aspiration. Also reviewed are intervention experiments that involved training parents to adopt behaviors that facilitated their children's academic success, and studies of the effects of parents' beliefs on boys' and girls' mathematics achievement. In addition to the family, the microsystem contains other settings that can be important socializers and determinants of academic development, including the school itself, the peer group, and the media. More research is needed to examine how the socialization process interacts with other levels of the environmental ecology to create and maintain patterns of ethnic group differences in academic learning, scholastic motivation, and movement through the schooling process. Contains 139 references. (SV)

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Chapter 7

COGNITIVE SOCIALIZATION AND COMPETENCE: THE ACADEMIC DEVELOPMENT OF CHICANOS

Luis M. Laosa and Ronald W. Henderson

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Chapter 7

Cognitive Socialization and Competence: The Academic Development of Chicanos

Luis M. Laosa and Ronald W. Henderson

It is now well known that Chicanos,[1] as a group, attain considerably lower levels of academic achievement than the national average (Orum, 1986; Valencia, chapter 1, this volume). This is a serious and persistent problem facing educators at all levels of the US educational system. More than an educational problem, however, this state of affairs has become a pressing social issue of growing significance and urgent public concern, given that this ethnic group represents a rapidly expanding proportion of the US population (US Bureau of the Census, 1988). Nevertheless, there is little agreement about the causes of the problem. Our goal in this chapter is to provide a context that we hope contributes toward a constructive understanding of these causes. To this end, we relate the question of causes to theory and research bearing on socialization processes and the development of competence in children and youth.

Socialization

Although there is some variation in how scholars of different disciplines and theoretical orientations conceptualize it, current definitions of *socialization* can be summed up as the process whereby the individual acquires the values, beliefs, ways of thinking, behavior patterns, and other personal, yet social, attributes that will characterize the person in the next phase of his or her development. Most concisely put, the study of socialization focuses on the development of the person as a participant in society (for a review of the evolution of the concept see Clausen, 1968).

Socialization may be viewed from the perspective of the individual or from that of a collectivity — be it the larger society or a constituent group. Some writers put the stress on the individual's learning or development; others emphasize the social apparatus that influences such learning and that defines for the individual the range of what is acceptable. In either case, socialization implies that the individual is induced in some measure to conform to the ways of the society

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or of a particular group. Socialization and social control therefore go hand in hand; they are complementary processes. Social control rests largely on the transmission of norms through socialization. Moreover, as Clausen further reminds us, the effectiveness of social control depends 'on the recruitment and socialization of (witting or unwitting) control agents' (1968, p. 6). As an underlying basis for social control, socialization leads the new member to adhere to the norms of the society or of the group and to become committed to its future (Clausen, 1968).

The process of socializing the growing child takes place through many avenues, including schools, television, and peers; but the family generally is, at least for young children, the primary arena for socialization. In recent years, there has been a growing awareness that socialization is not always a unidirectional process; there is evidence that children influence their parents or teachers as well as vice versa (for reviews of research see Brophy and Good, 1974; Dusek and Joseph, 1983; Henderson, 1980; Laosa, 1977a; Maccoby and Martin, 1983; Peterson and Rollins, 1987; Sigel, Dreyer and McGillicuddy-DeLisi, 1984). But, as Maccoby and Martin (1983) caution us, this idea should not lead us to lose sight of the enormous differential in power that exists between an adult and a child, and the potential for asymmetry thus involved.

Although the point is seldom clearly made, socialization is by no means always a purposive endeavor. It comprises, of course, situations in which a socialization agent consciously seeks to modify or mold the individual toward more or less clearly envisioned outcomes. But the concept also includes the kinds of incidental learning, or experiencing, that occur, often unwittingly, when one lives among others. Some dimensions of the socialization process are indeed quite subtle, and only with difficulty can they be brought into awareness. This characteristic does not make them insignificant or inconsequential. On the contrary, it is just because they are frequently subtle and outside of our immediate awareness that the study of socialization process and outcomes becomes a particularly challenging endeavor.

Social and behavioral scientists are not alone in their sensitivity to the implications of the individual's experience for his or her development and public behavior as a member of the society. Parents, educators, and other socialization agents generally have in mind some conception of what the child is 'supposed to become' and of the role that any child-rearing or educational practice may play in achieving or hindering the desired outcome (Inkeles, 1968b; Laosa, 1983). This sensitiviy is also evident in the growing public concern over the impact on the future of the society of persistent poor academic achievement by an ever expanding Chicano population. That is, there is an urgent concern with the ability of the present generation of young children in the United States — an increasing proportion of whom are Chicanos and similarly situated minorities — to maintain, upon becoming adults, the nation's technological and economic competitiveness and to support adequately the aging mainstream population. This is a well-founded concern, and it is reflected perhaps nowhere better than in the recent spate of reports by national and regional commissions on the status of youth and education in the United States (Board of Inquiry, 1985; National Commission on Excellence in Education, 1983; Regional Policy Committee on Minorities in Higher Education, 1987; Youth and America's Future, 1988).

Competence

Whereas socialization refers to the process whereby attributes are acquired, the concept of *competence* stresses the end product, namely, the person as he or she is after having been socialized. Socialization and competence are thus intimately linked concepts (Inkeles, 1968a; Laosa, 1979/1989, 1983). Generally, the goal of socialization is to produce competent people. But, specifically, what is competence? Lay conceptions of competence are generally broad and evaluative. Thus, the *American Heritage Dictionary* defines a competent person as one who is '1. Properly or well qualified; capable.... 2. Adequate for the purpose; sufficient' (1982, p. 301). On the other hand, theoretical definitions of competence vary considerably, as differing conceptions of the term have been advanced in both the psychological and sociological literatures.

In the sense that White (1959, 1979) has used the term, for example, competence refers to the exercise of behaviors that lead to a feeling of efficacy and thus to a source of gratification that is universally and spontaneously sought by all humans. Thus, for White, competence is primarily a biological concept. Humans, he argued, have an urge to act effectively on the environment, and a primary factor in developing competence is how self-gratifying or intrinsically rewarding one's behavioral initiatives are to the individual. On the other hand, in Inkeles' (1968a, b) conception, which is rooted in the structural tradition of role-status theory, the emphasis is upon acquired information, skills, motives, and styles of thinking and of expressing affect. For Inkeles, then, competence is largely a matter of acquired capacities for role performance. In his view, competent performance is measured against the role requirements of the various statuses or positions in the social structure that a person may occupy. From yet another perspective, which stems from the symbolic-interactionist and neo-Freudian traditions, the focus is on the interactional process in role relationships; in this formulation, role relationships are conceived primarily in interpersonal rather than social-structural terms (e.g., Foote and Cottrell, 1955; see also Smith, 1968).

Vygotsky's writings, which have attracted considerable attention among developmental psychologists in recent years, provide still another conception of competence. An attractive feature of the Vygotskyan perspective is the attempt it represents to avoid the intellectual isolation across disciplines that frequently separates studies of individual psychology from research on the social and cultural environment in which individuals live (Wertsch, 1985). For Vygotsky, the individual's development is an integral part of the sociocultural setting in which the person functions. Indeed, a central tenet of his formulation is that mental processes have their origin in social processes. *Mediation* is a key concept in understanding this relation. Specifically, Vygotsky defined development in terms of the emergence or transformation of forms of mediation, and his notion of social interaction and its relation to mental processes involves mediational mechanisms. He argued that mental processes can be understood only if we understand the 'tools and signs' that mediate them. *Tools* and *signs* in this formulation refer to habits and forms of cultural behavior, cultural methods of reasoning, and the cultural meanings of particular stimuli. In short, for Vygotsky the psychological characteristics of persons are a joint, interactive function of the biological features and potentialities of the human species, on the one hand, and, on the other, of the forms of psychological functioning and possible sources of

development existing in a given culture or subculture at a particular point in its history. It thus follows that the repertoire of psychological processes and outcomes available as possibilities for individual development can vary across cultures or subcultures, and that alterations in social or cultural conditions can bring about decisive changes in forms of behavior and modes of thought (Vygotsky, 1929, 1978; the same line of theorizing is found in the work of Luria, 1928, 1976).

In some respects, Vygotsky's views are similar to the longstanding tradition in psychological anthropology that argues that different environmental demands lead to the development of different patterns of ability (see, e.g., Laboratory of Comparative Human Cognition, 1983). These conceptions are compatible with Laosa's (1979/1989) *developmental, socioculturally relativistic paradigm*. From the perspective of Laosa's paradigm, social competence involves functional adaptations to specific environments. Each environment may have its own specific demand characteristics for functional adaptation, and a person's success in two different environments may depend on the degree of overlap in the demand characteristics of the environments. This paradigm is particularly appealing because it provides a useful way of approaching the problems that arise in defining competence in complex, changing, and culturally diverse societies — such as the United States — in which individuals, at virtually every phase of their life span, find themselves in environments with very different demand characteristics.

Finally, in considering our topic, we must continually remind ourselves of the conceptual distinction between *proficiency* and *performance*. This distinction acknowledges the difficulty of making inferences about capability without regard for the cultural context and analogous factors that can play as large a role as capability in determining the level of response in any given situation (Anderson and Messick, 1974; Laosa, 1979/1989). A child's performance in a particular classroom setting, for example, may not always be a sign of his or her potential competence in an environment better suited to that child.

The Environmental Ecology

Participation in society means participation in a complex social order; yet the dominant conceptions in the study of human development and education have tended to separate not only the individual from the family for independent examination but also the family from the society. Exceptions to these conceptions include the theoretical formulations of such ecologically oriented psychologists as Bronfenbrenner (1979), Laosa (1979/1989), and Sameroff (1983).

Within developmental psychology, the most visible and systematic emphasis on the need to formulate ecological models for the understanding of human behavior has been the work of Bronfenbrenner (1977, 1979, 1988). Bronfenbrenner emphasizes 'the progressive accommodation, throughout the life span, between the growing human organism and the changing environments in which it lives and grows' (1977, p. 513). This emphasis is found also in Laosa's (1979/1989) developmental, socioculturally relativistic paradigm and in Sameroff's (1983) general systems approach.

Bronfenbrenner's (1979, 1988) conception has much in common with our ideas, and it contributes a useful framework and vocabulary. He conceives of the environment as a set of four nested structures, each inside the next. At the

innermost level (the *microsystem*) is the immediate setting — an environment with particular features, activities, and roles — containing the developing person. This can be the home, the classroom, the testing room, and so on. The next level, or *mesosystem*, comprises the relations among one's major settings at a particular point in one's development. In the present view, such interconnections can be as decisive for development as events taking place within a given setting. A child's ability to learn to read in school, for instance, may depend as much on the existence and nature of linkages or continuity of experiences between the school and the home as on a particular teaching technique (Laosa, 1977c, 1982b).

The third level of the ecological environment evokes the hypothesis that the person's development is profoundly affected by events occurring in settings in which the person is not even present. This is the *exosystem*, in which the mesosystem is embedded (Bronfenbrenner, 1979, 1988). It includes, for example, the parents' experiences in the world of work as factors indirectly influencing the child's immediate context.

Finally, pertaining to all three former levels, there is the overarching *macrosystem*, which refers to the 'blueprint' that every society, culture, or subculture has for the organization of every type of setting. This blueprint can be changed, with the result that the structure of the settings in a society can become markedly altered and produce corresponding changes in human behavior and development (Bronfenbrenner, 1979). For example, an economic crisis occurring in a society can have an impact on the child's immediate settings and thence a longstanding influence on children's subsequent development. Similarly, a change in a society's policies affecting the relations between the home and the school may produce effects detectable in the child years later.

The primary focus of the remainder of this chapter is on the first level in Bronfenbrenner's classification, namely, the microsystem; more specifically, the focus is on the innermost aspect of the microsystem level — the family. Space considerations preclude an exhaustive review of the research literature on Chicano children's socialization in the family. We have selected for review, therefore, studies that illustrate principal strands in this literature. When necessary for placing these works in context, we also refer to research on other ethnic groups.

Family Interaction

The innermost level in the environmental ecology of the child is, as we just saw, the household family. Beginning at this level of the ecological system, one of the basic units of analysis is the dyad, or two-person system (Bronfenbrenner, 1979).

In keeping with the traditional focus of collecting research information on individuals, behavioral and social scientists typically gather data on only one person at a time. Partly because of the difficulties and expense involved in conducting reliable observations of people in interaction, research on Chicanos has seldom included observations of actual family interactions using systematic samples of adequate size. Among the few exceptions is Laosa's work on maternal teaching strategies. A principal aim of these studies was to contribute empirical data that might help explain, at least partly, ethnic group differences in academic performance.

As Laosa (1981a) makes clear, the choice of maternal behavior in these

studies does not reflect a belief that the mother's behavior is the only important source of influence in the development of the young child or that only biological mothers, or women, are or should be responsible for the care of children. Many relationships can and do play influential roles in the course of a child's life. Certainly the father, although ignored in much of the available research, plays a substantial role in the lives of many children. The same can be said of sibling relationships. Nevertheless, in most cultural settings one finds that, of all the relationships during the child's early years, the ordinary everyday interactions between mother and child constitute a paramount — or at least a very important — aspect of the social environment of childhood. A fundamental assumption is that the mother, in her everyday interactions with her child, continually functions (wittingly or unwittingly) as a teacher. Thus, much of the implicit curriculum and instructional method to which the child is exposed in the home, especially during the early years, is mediated by maternal teaching strategies. A primary focus of the study of mother-child relationships is on identifying diverse patterns of mother-child interaction, how these different styles of mother-child relationship develop, and how they are related to particular child behaviors outside of the maternal relationship (Laosa, 1981a).

Research on non-Chicano populations has shown that depending on the family's social class, mothers use different strategies to teach their young children (for a review of research see Laosa, 1981a). Traditionally in such studies, specific socioeconomic status variables (e.g., mother's and father's occupational status and education) have been either employed interchangeably or aggregately subsumed under a general index of social class or a global measure of socioeconomic status. But Deutsch (1973) and Laosa (1978, 1981a, 1982b) argue that it may be more appropriate and useful to view social class or socioeconomic status not as a unitary dimension but as a conglomerate of different variables, such as occupation, education, and income, that must be examined separately. One of the issues addressed by Laosa (1978), therefore, centered on the relationship between particular socioeconomic status variables, on the one hand, and maternal teaching behaviors, on the other. Thus, one aim of Laosa's (1978) study was to 'unpackage' different components of what is commonly labeled either social class or socioeconomic status, an exosystem factor, and then to examine the influence of these particular components of the exosystem upon the microsystem dimensions of mother-child interaction.

In one study, Laosa (1978) conducted direct observations of Chicano mothers in their homes while they taught cognitive-perceptual tasks to their own 5-year-old children. The sample consisted of forty-three Chicano families residing in Los Angeles; the sample was selected to be as representative as possible of Chicano families in the United States with regard to the distributions of socioeconomic and parental schooling levels. Using the Maternal Teaching Observation Technique (Laosa, 1980b), trained observers recorded the frequency of occurrence of nine categories of maternal behavior. Reliability and short-term stability analyses indicated that these measurements represented adequately reliable and moderately stable attributes of maternal behavior (Laosa, 1980b).

Laosa's (1978) analyses revealed significant correlations of substantial magnitude between the mothers' teaching behaviors and their own level of schooling (i.e., years of formal schooling). In contrast, there was very little relationship between these maternal teaching behaviors and either the mothers' or the fathers'

occupational statuses. These results indicate that the schooling level attained by a Chicana is a strong predictor of the strategies that she, once she becomes a mother, will use in teaching her own children.

Specifically, the correlations obtained by Laosa (1978) between the mothers' schooling level and their own teaching strategies were as follows. The mothers' schooling level was positively related to their frequent use of *inquiry*, which refers to the use of questions as a teaching modality. The mothers' schooling level was also positively related to their frequent use of *praise*, namely, verbal expressions of approval of the child's activity or product. In contrast, the mothers' schooling level was inversely related to their use of modeling as a teaching strategy; *modeling* here refers to the mother's doing parts of the task for the child's observation and imitation. Thus, the frequency of use of each of these three distinct maternal teaching strategies varied widely as a function of maternal schooling level. In short, the Chicana mothers with fewer years of education taught more frequently through a modeling or demonstration approach. That is, they tended to demonstrate the solutions so that the child could learn through observation. In contrast, the more highly schooled Chicana mothers taught more often through a style characterized by the frequent use of questions and verbal praise.

In discussing the results of this study by Laosa (1978), LeVine (1980) has called attention to the striking similarity between the approach to teaching employed by the more highly educated Chicana mothers and the academic style of school classrooms. The more educated Chicana mothers taught through a more conversational style (i.e., *inquiry*) rather than motoric demonstration (i.e., *modeling*), and they especially included verbal reinforcement (i.e., *praise*). One might say the more highly schooled Chicana mothers 'imitated' the academic style of the school classrooms in which they had spent so much of their lives (Laosa, 1982b).

Although these findings are correlational, they suggest that, at least among Chicanas, schooling has a marked impact on certain behavioral dispositions that determine the manner in which they, once they become mothers, interact with their children. These findings raise provocative questions about the role that schooling plays in influencing the evolution of culture, and, specifically, in influencing the evolution of cultural patterns of family interaction. (By *evolution* is meant change through adaptation and not progression toward some superior stage.)

Some of these questions were posed in a subsequent study, in which Laosa (1980a) compared the teaching strategies of Chicana mothers to those of non-Hispanic White mothers. The results showed significant differences in the maternal teaching strategies of these two groups. In general, compared to the Chicana mothers, the teaching strategies of the non-Hispanic White mothers were more similar to the academic teaching style that one expects to find in school classrooms. These ethnic group differences in mothers' teaching strategies virtually disappeared, however, when the analyses controlled statistically for the mothers' years of education.

Taken together, the results of these studies led Laosa (1982b) to propose a hypothetical model to explain the high frequency of scholastic failure among Chicanos and other populations in which parents, on the average, have completed relatively few years of schooling. The general hypothetical model can be

summarized as follows: the children of the more highly schooled parents learn to master in their homes the form and dynamics of teaching and learning processes that 'take after' those of the school classroom. Because of this relative similarity, the interactional processes that these children learn to master at home will have adaptive value in the classroom. Insofar as the children of the more highly schooled parents learn to master classroom-like interactional processes in their homes, therefore, they will have a decided academic advantage over the children of the less-schooled parents since the latter, by contrast, learn to master in their homes the form and dynamics of teaching and learning processes that have comparatively little adaptive value in the classroom (Laosa, 1982b). To the extent that the relational systems of family and school differ from one another, the child and the classroom teachers will be unable to draw on a shared process of teaching and learning. As a result of this *discontinuity* between the family and the school, the child and the teachers will spend a great portion of their time simply attempting to make sense out of one another's behavior. Hence, school failure for many Chicanos probably occurs, at least partly, because they and their teachers are unable to make sense of each other's relational systems. The Laosa (1982b) model further posits — and his data suggest — that the extent to which the family and the school will share in common a relational system for teaching and learning depends, at least in part, on the length of the parents' schooling experience.

Family Constellation

Another feature of a child's microsystem is the *family's constellation*, that is, such characteristics as the child's family size and sibling structure. Family constellation is relevant to the topic of this chapter for two related reasons. First, demographic statistics show that Chicanos, as a group, differ from non-Hispanic Whites in family constellation (Bean and Tienda, 1987). Second, some researchers have suggested that family constellation influences children's cognitive development (e.g., Zajonc, 1976, 1986). Thus, the question arises: Does family constellation explain the difference in academic performance between Chicano and non-Hispanic White students?

Chicanos, on the average, produce a relatively large number of offspring. Demographic studies demonstrate clearly and consistently that the fertility level of Mexican Americans exceeds those of all other major ethnic or racial groups in the United States, including other Hispanic groups (Bean and Tienda, 1987). Moreover, the fertility difference between Mexican Americans and non-Hispanic Whites is reduced, but not eliminated, when such factors as age, education, income, labor force participation, and generational status are held constant (Bean and Tienda, 1987). Compared to other ethnic groups, therefore, Chicanos have more siblings and, consequently, are less likely to be the firstborn or the only child. Now, juxtapose these demographic differences to the large body of theory and data suggesting that sibling structure and family size influence children's cognitive development, including academic achievement (for reviews see Cicirelli, 1978; Henderson, 1981; Marjoribanks, 1979; Zajonc, 1983, 1986). Indeed, numerous studies, including a few on Chicano families, have examined the relationship between family constellation and children's development. Several

family constellation variables have been studied, particularly sibship size (the total number of siblings in a family), birth order (the relative rank of a child in terms of the age hierarchy among siblings), and the presence or absence of a father in the household. This literature, to which we now turn, provides a context for examining the question of whether and how family constellation, among Chicanos, might influence the foundations of intellectual performance that are likely to predict academic achievement.

Sibship size Many studies have shown an inverse correlation between sibship size and indices of children's cognitive development (e.g., Belmont and Marolla, 1973; Blake, 1989; Breland, 1974; Kellaghan and Macnamara, 1972). Unfortunately, much of the research on the effects of family size on cognitive development has been subject to confounding. A frequent confounding variable is socioeconomic status (SES), because there is generally a correlation between SES and sibship size; that is, lower SES families generally tend to have more children than the more affluent and better educated families (Westoff, 1986). Because usually there is also a correlation between SES and cognitive test performance (Deutsch, 1973; Hess, 1970), it is difficult to isolate the statistical effects of SES and family size, respectively, on cognitive scores. Kellaghan and Macnamara (1972) addressed this problem by studying Catholic families in Ireland, where large families tend to be valued at all SES levels. Significantly, even in this cultural setting, where it was possible to limit the confounding of sibship size and SES, there was the typical correlation between sibship size and cognitive test performance.

A notable exception to the typical inverse correlation between sibship size and cognitive performance was reported by Rankin, Gaite, and Heiry (1979). These researchers tested the hypothesis that the frequently observed correlation between sibship size and cognitive test performance can be explained on the basis of cultural expectations and values. Their sample consisted of elementary-grade children in American Samoa, a cultural setting where large families are the norm. An instrument especially designed for this cultural population was used to measure cognitive ability. Rankin and his associates did observe an association between sibship size and cognitive performance among Samoan children, but this relationship was curvilinear. Children from families closest to the sibship size that is the norm within Samoan culture attained the highest cognitive performance. In a culture where large sibships are the norm, children in families near the average size showed superior cognitive performance than those from either small or very large families. This finding suggests that cultural values mediate the association between family size and cognitive performance. This conclusion raises the question of whether the large body of published research on family constellation is generalizable to Chicanos, since Chicano culture is largely different from that of the samples in most of this research. Only a few studies of Chicanos have given explicit attention to the relation of family size to cognitive performance. This research is discussed below.

Some of the early research suggested that the inverse association between sibship size and cognitive performance observed in non-Hispanic White samples may indeed generalize to Mexican American families. Henderson and Merritt (1968), for example, compared the family characteristics of Mexican American children who scored particularly high on two tests of cognitive ability with the

families of children of the same ethnicity who scored particularly low. Both groups of children attended the first grade in schools in Tucson, Arizona. Henderson and Merritt (1968) found that the low-scoring group had significantly larger sibship sizes than did the higher-scoring group.

The above finding must be interpreted cautiously, however, because household family size among Chicanos is heavily confounded with socioeconomic status and home language. Indeed, Henderson and Merritt's (1968) analyses revealed that their two groups of Mexican American children differed not only in the number of siblings, but also in maternal schooling level and socioeconomic status. Valencia, Henderson and Rankin (1981) attempted to untangle such confounding of variables in a study of Mexican American preschoolers and found that when statistical controls were applied to cope with the problem of covariation among predictor variables, the hypothesis of an association between sibship size and the children's cognitive development was not supported. This finding is congruent with results obtained by Laosa (1984a) in a study comparing Chicano and non-Hispanic White toddlers. Let us examine these two studies in some detail.

Given that the Mexican American population is one in which children typically score below the norms on measures of intellectual performance (although there is substantial variation within the population -- Duran, 1983; Ramist and Arbeiter, 1986; Sawyer, 1987), and because in this population relatively large families are the norm (US Bureau of the Census, 1988) and seem to be valued (Bradshaw and Bean, 1972), Valencia and his colleagues (1981) set out to ascertain how much of the variance in Mexican American children's cognitive performance they could explain (statistically) by family constellation, compared with other family characteristics. Their sample consisted of 190 Mexican American preschool enrollees in various cities and towns in southern California; only very poor families with both parents present were included. Data were gathered on the following variables: the child's age, sex, sibship size, and ordinal position in the sibship, the parents' schooling attainment level and country of schooling, the language (English or Spanish) spoken in the home and used in the test administration, and the Hollingshead indices of socioeconomic status and social class. In order to cope with the colinearity that is common to such data, the variables were reduced to three factors by means of a factor analysis. The first factor had the highest loadings for the language and parental schooling variables; the second, for the socioeconomic and social class indices; and the third factor was defined by the child's sibship size and ordinal position.

Factor scores were used as independent variables in multiple regression analyses in order to identify the most powerful one-, two-, and three-variable models for the (concurrent) prediction of the Mexican American children's scores on the General Cognitive Index of the McCarthy Scales of Children's Abilities. The best single predictor (it accounted for 6.8 per cent of the variance in cognitive scores) was the factor defined by parental education and language. The SES factor accounted for an additional 3.6 per cent of the variance when added to the first factor to form the most powerful two-variable model. Finally, in the best three-variable model, the sibling constellation factor explained only an additional 2.8 per cent of the variance in cognitive scores.

This research by Valencia *et al.* (1981) suggests that, for Mexican Americans, the number of children in the household and birth order account for a very small

proportion of the variance in young children's cognitive development. The results further suggest that parental schooling level and other socioeconomic characteristics together account for much more of this variance. These findings are harmonious with those obtained by Laosa (1984a).

Laosa (1984a) studied the family characteristics and various abilities of young children in two different ethnic groups — Chicano and non-Hispanic White. The purpose of this study was to test several hypotheses about the possible causes and origins of the frequently observed difference in academic achievement between these two populations. One of the hypotheses centered on whether ethnic group differences in family size and sibling structure explain the corresponding group difference in children's cognitive performance. Juxtaposing (a) the demographic evidence indicating that Chicanos on the average produce a relatively large number of offspring and also are likely to reside in households with more adults than do members of the other ethnic group (Bean and Tienda, 1987; US Bureau of the Census, 1988) to (b) the large body of literature — mentioned above — suggesting that family size and sibling structure influence cognitive development, Laosa (1984a) set out to assess the relative contribution of several variables, including family constellation, to variance in young children's cognitive performance. Laosa's focus in this study was on very young children (2.5 years old), because an additional purpose of the research was to determine how early in the life course any such effects on cognitive performance commence to show palpably their impact.

Laosa's (1984a) sample consisted of 171 Chicano and non-Hispanic White families with a toddler. The samples were selected to be representative of their respective ethnic populations with regard to the distributions of socioeconomic status and parental schooling level; in order to control for the potentially confounding effects of single parenting, the sample only included households with both parents. Both ethnic samples were drawn from the same geographic area — a large urban center in south-central Texas. The variables measured in the study were: household income, each parent's schooling attainment level, father's occupation, child's birth order, whether the child was an only child, the number of children residing in the household, and the number of adults residing in the household in addition to the parents. Language variables also were measured — the percentage of household verbalizations in English (v. Spanish or a dialect that mixes/switches between the two languages) for each of the following dyads and directionalities: mother to child, child to mother, father to child, child to father; and the percentage of English verbalizations during testing, also by directionality, namely, examiner to child and child to examiner. The child's performance in each of five ability areas was measured, respectively, by the Verbal, Perceptual-Performance (nonverbal reasoning), Quantitative, Memory, and Motor scales of the McCarthy Scales of Children's Abilities. Ethnicity and sex of child were the major independent variables.

The zero-order (i.e., uncontrolled) intercorrelations among the variables were similar for the two ethnic groups. Interestingly, for neither ethnic group was there a significant zero-order correlation between any of the child performance variables, on the one hand, and, on the other, the number of children in the household, the child's birth order, or whether the child was an only child. These findings strongly suggest that any effects of these sibling structure variables on

children's development do not occur, or at least do not become visible, before the third year of life.

A comparison between the above finding by Laosa (1984a) and the data reported by Valencia *et al.* (1981) permits pinpointing the specific age at which the frequently observed zero-order correlation between sibling structure and cognitive performance can first be observed. The average age of the Valencia *et al.*'s (1981) sample was 4.5 years, and they report zero-order correlations of −.24 and −.21, respectively, for the number of children in the home and the child's birth order with the child's cognitive score — in spite of the restricted SES range of their sample. In contrast, the age of Laosa's (1984a) samples was 2.5 years, and he obtained a mean zero-order correlation of only .08 between the four cognitive scales in his analyses and these two sibling structure variables for the Chicano sample. These results are all the more impressive when one considers that the SES range in Laosa's (1984a) sample was not restricted, whereas the range of the Valencia *et al.* sample was highly curtailed. Taken together, these differences between Laosa's (1984a) and the Valencia *et al.* (1981) data suggest that the frequently observed (zero-order) correlation between sibling structure and cognitive performance emerges initially during the third and fourth years of the child's life.

By means of a principal-components analysis of the fourteen variables for the combined ethnic sample, Laosa (1984a) uncovered three clearly defined factors. (Orthogonal and oblique solutions were obtained, revealing no difference between rotation methods.) Factor 1 was defined by the language variables; Factor 2, by the family constellation variables; and Factor 3 was defined by the socioeconomic and parental schooling measures.[2]

Laosa's (1984a) analyses of the children's test scores revealed significant ethnic group differences in the children's verbal, quantitative, and memory performance (no differences in nonverbal reasoning or motor performance). Laosa then performed a series of analyses of covariance in order to ascertain whether these ethnic group differences in children's performance could be explained (statistically) by the three aforementioned factors, either individually or in combination. The results showed that the family constellation factor explained very little, if any, of the ethnic group differences in the children's performance on the ability scales. In contrast, the SES and home language factors accounted for significant portions of the between-group variance in this performance; indeed, the ethnic group differences in children's performance became nonsignificant when the SES and home language factors were simultaneously controlled.

Laosa (1984a) also found that there were no significant *within*-group correlations of scores on any of the five ability scales with the number of household children, the child's birth order, or whether the child was an only child; this was true in both ethnic groups. It should be noted, however, that Laosa (1984a) obtained significant (positive) correlations between the number of adults (in addition to the parents) residing in the Chicano households and the children's scores on two ability scales — Quantitative and Motor. As Laosa (1984a) notes, the latter finding bears on the confluence theory proposed by Zajonc and Markus (1975), a theory discussed in the next section.

In sum, both Laosa (1984a) and Valencia *et al.* (1981) found that, at least during early childhood, neither the number of children in the home nor the

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child's birth order has much of an impact on Chicano children's cognitive development. The results of both studies are also congruent in clearly pointing to the family's socioeconomic level and home language as being significantly related to Chicano children's performance on cognitive tests; this relationship was even prior to the third birthday and thus long before school entry.

Confluence model The *confluence model* gained much attention when it first appeared in the research literature in the mid 1970s. This theoretical model was proposed by Zajonc and Markus (1975) in an attempt to explain research data showing an association between family constellation and children's cognitive performance. The model, acclaimed for its parsimony, proposes that the intellectual environment of a family has a direct influence on the intellectual development of the children born into it. As defined by the model, the intellectual environment consists of the average intellectual ability of all family members. (The intelligence construct employed in this theoretical model is more akin to the concept of mental age than to IQ.) Adults are cognitively more advanced than children, and therefore they contribute more intellectual stimulation to the family environment by virtue of their greater experiences and accumulated learning opportunities; conversely, the arrival of an infant can worsen the intellectual environment by lowering the average intellectual ability of its members. Thus, according to the confluence model, a child's intellectual environment is 'diluted' by the presence of younger siblings. The model, however, also proposes that children with younger siblings are able to engage in teaching them and thereby perhaps to improve their own intellectual ability. Research on family interaction does suggest that older siblings can serve as effective intellectual resources for their younger siblings (Laosa, 1982a; Norman-Jackson, 1982; Stewart, 1983); it also suggests that teaching itself can benefit teachers as much as learners (Bargh and Schul, 1980; Cohen, Kulik and Kulik, 1982).

In part, the extraordinary interest generated by the confluence model was stimulated by Zajonc's (1976) suggestion that the observed declines in national Scholastic Aptitude Test (SAT) scores merely reflected a population bulge of children from large families who were heavily represented in the pool of test takers. Zajonc (1976, 1986) predicted that the average scores would begin to rise as children from a generation of smaller families approached college age and entered the pool. Although the predicted rise in SAT scores did indeed occur (Zajonc, 1986), the confluence model is the subject of considerable scientific controversy.

Tests of the model on other types of data have been attempted with greater (e.g., Berbaum and Moreland, 1985) and lesser success (Melican and Feldt, 1980; Page and Grandon, 1979; Velandia, Grandon and Page, 1978), and the model has been criticized on several grounds. Critics of the model raise questions about the appropriateness of the populations studied, the levels of data aggregation, the details of the calculations, and the logical basis of the model (Henderson, 1981; Scott-Jones, 1984; Steelman, 1985), while proponents of the model refute criticisms and question the suitability of the statistical analyses techniques and the omission of certain variables (Zajonc, 1983).

Most studies of the confluence model are based on samples of non-minority populations in the United States and Western Europe. Given the restricted cultural variability represented in such studies, it is important to establish

whether the empirical findings apply to other cultural groups. The question of whether the model is generalizable to other populations was addressed in a study of a large sample of college applicants in Colombia, South America (Velandia *et al.*, 1978). Neither the predicted associations between birth order and intelligence nor the relation of intelligence to family size were upheld. In a follow-up study with a large national sample in the United States, Page and Grandon (1979) found that the apparent effects of family size were best explained by ethnic group and social class variables. These results are consistent with those obtained by Laosa (1984a) and Valencia *et al.* (1981) for Mexican American young children. The little research that exists on Mexican American samples shows no significant effects of sibship size or birth order on intellectual development once proper controls for other background variables are taken into account (Laosa, 1984a; Valencia *et al.*, 1981) — more precisely, if any such effects occur, they are not evident in early childhood.

Single Parenting

The aforementioned studies of Chicano families by Laosa (1984a) and Valencia *et al.* (1981) focused on *two-parent* families — that is, on households in which the child resided with both mother and father. By designing their sampling plans in this manner, these investigators successfully avoided confounding their results with possible effects due to differences between one- and two-parent families. Although a large majority of Chicano children reside with two parents, some of them live in solo-parent households; in 1988, 18.5 per cent of the Mexican-origin families in the United States were headed by a woman with no husband present (US Bureau of the Census, 1988; see also Laosa, 1988a).[3]

The issue is important because the research literature suggests that compared with children in two-parent households, those in single-parent homes are more likely to develop academic and conduct problems in school (for a research review see Hetherington, Camara and Featherman, 1983). Because almost all of this research is based on non-Hispanic White or Black samples, the question arises as to whether these findings generalize to Chicanos. Do Chicano children in solo-parent families develop differently from those in two-parent households? Is the scholastic performance of Chicano children affected by whether they live with one or two parents? Are there features of Chicano culture that serve to buffer or moderate the effects of solo parenting observed in children from other cultural groups?

These questions were addressed by LeCorgne and Laosa (1976) in a study designed to test the null hypothesis of no effects due to solo mothering on Mexican American children's cognitive and psychosocial development. The sample consisted of 248 fourth-grade students in a predominantly Mexican American, urban area in south-central Texas. About half of the children were selected for the sample because they did not have a father or male father surrogate (other than an older sibling) living at home, whereas the other half were randomly selected from among those living in two-parent households. Only Mexican American families at or below the poverty level were included. The data were analyzed using a 2 × 2 (father presence/absence by child's sex) analysis of covariance (child's chronological age covaried). LeCorgne and Laosa's analyses

uncovered important differences between Mexican American children of the two family types.

Among the dependent variables examined by LeCorgne and Laosa were classroom teachers' ratings of the students' psychosocial adjustment. The teachers were instructed that school achievement was not to be a consideration in making the personal adjustment ratings, but that the child's 'self-concept and relationship to others' (p. 470) should be the major consideration. The analyses revealed that both the main effect of family type and the interaction with child's sex were significant for this variable. Specifically, the teachers' ratings showed more signs of school maladjustment in boys of solo mothers than in boys of two-parent homes or in girls of either family type. This finding suggests a differential effect of father absence on boys and girls.

LeCorgne and Laosa's (1976) finding of a significant family-type-by-child's-sex interaction for teachers' ratings of Mexican American children's school adjustment is consonant with data on other populations suggesting that boys are more susceptible to certain forms of stress than girls (e.g., Rutter, 1979). Although little is known about the reasons for this sex difference, recent reviews of the research literature do indeed point to the conclusion that boys may respond more negatively than girls to some forms of psychosocial stress, including the stresses from divorce (Hetherington *et al.*, 1983; Zaslow, 1987; Zaslow and Hayes, 1986). LeCorgne and Laosa's (1976) findings add confirmatory evidence for this general hypothesis and extend it by showing that the sex difference in vulnerability to certain forms of psychosocial stress, a vulnerability that has been observed in research on other ethnic populations, is generalizable to Mexican Americans. Specifically, LeCorgne and Laosa's data show that solo mothering appears to have no deleterious effect on Mexican American girls' psychosocial adjustment to school (at least during middle childhood), whereas something as yet undetermined about the experiences associated with solo mothering seems to affect negatively the school adjustment of Mexican American boys.

A plausible explanation for this sex difference, offered by Hetherington *et al.* (1983), is that separation from the father may represent a more important loss for a male than for a female, both as a figure of identification and as a disciplinarian. Research indeed suggests that girls in father-custody families exhibit some of the same difficulties in social behavior as do boys in mother-headed, one-parent families (Camara and Resnick, 1988; Santrock and Warshak, 1979; Santrock, Warshak and Elliott, 1982). This finding suggests that separation from the same-sex parent may be particularly difficult for children. Given the present, most common custodial arrangements (Maccoby, Depner and Mnookin, 1988), therefore, boys may be at higher risk for deleterious outcomes from family disruption and divorce than are girls.

LeCorgne and Laosa's (1976) study also included three measures of the children's cognitive-perceptual development — the Raven Coloured Progressive Matrices, the Goodenough-Harris Drawing Test, and the Bender-Gestalt Test. There were no significant differences between family types (and no interactions with sex) for either Raven or Bender-Gestalt developmental scores. There was, however, a significant difference in Goodenough-Harris scores, suggesting a higher level of conceptual development for the group of two-parent children. In interpreting this result, LeCorgne and Laosa point out that, although the sample included only poor families, this difference in cognitive performance could be the

outcome of very small differences in socioeconomic level between the two family types. National statistics show lower average incomes for solo-mother than for two-parent households (Laosa, 1988a); and the lower a family's economic status, the more important small dollar differences may become. Indeed, Harris and Roberts (1972) found a noticeable increase in mean Goodenough-Harris scores between children from families with incomes of less than $3,000 and those of $3,000 to $4,999.

The latter observation brings forward yet another effect of diversity in family structure, namely, family income. Laosa (1988a) recently examined the economic implications of single parenting. His analyses, as mentioned above, clearly show that solo mothers and the children living with them are, on the average, economically disadvantaged compared with those in two-parent families; this is true irrespective of ethnicity or race. This situation is partly the result of sex inequalities in income, as the average woman earns lower wages per hour than does the average man (Fuchs, 1986). Even when all of the variance predicted by family structure can be explained by the socioeconomic level of the family, however, we should not ignore the causal links in the process (Hetherington *et al.*, 1983). Divorce, separation, or death of a spouse may create low socioeconomic conditions in the home, and such conditions in turn can influence the child's academic attainment.

Environmental Processes in the Home

Whereas some studies of socialization, such as those discussed in the preceding section, focus on the influence of 'molar-level' sociodemographic variables on children's development — such as household income, parental education and occupation, family size and structure — other studies attempt to examine the effects of 'micro-level' processes. Such micro-level processes are often hypothesized to act as intervening or mediating variables that may explain the association between the molar-level factors and the child's development. A good example of micro-level processes are the data on teaching strategies that Laosa (1978, 1980a, 1982b) obtained through direct observations of the interactions between Chicana mothers and their own children, discussed elsewhere in this chapter. In this section the focus is on research in which interviews — rather than direct observations — are used to obtain data on micro-level processes in the home.

Among the early research on environmental process variables is the work stimulated by Benjamin Bloom, who recognized the need for knowledge about the learning processes that occur in the home and other features of the home environment that facilitate intellectual development. Two of Bloom's doctoral students — Davé (1963) and Wolf (1964) — hypothesized several home effects on intellectual performance on the basis of an extensive literature review, and they devised a focused interview approach to measure them. Davé and Wolf found that the home environmental process variables that they measured through interviews with (non-Hispanic) parents of elementary-grade children were remarkably good concurrent predictors of both academic achievement (multiple R = .80) and IQ (multiple R = .70). These associations have been replicated in different countries (Marjoribanks, 1979) and with different cultural groups, including Mexican Americans (Henderson, 1966; Henderson and Merritt, 1968).

The principal environmental process variables in these studies are represented by those employed in Davé's (1963) research; among them are 'achievement press', 'language models', 'academic guidance', 'activeness of family', and 'intellectuality in the home'. The measurement procedures are intended to identify specific parental behaviors rather than statements of attitudes or intentions. For example, parents' goals and aspirations for their children are subsumed under the 'achievement press' variable. Interview items and probes relevant to this variable are designed to identify and quantify such parental behaviors as the reinforcement practices for the child's academic performance and the achievement standards on which these practices are based. Additional indices of this variable are derived from interview questions tapping into parents' concrete knowledge of the developmental and educational progress of their children and into the specific plans and preparations they have made to accomplish the educational goals they claim to hold for their children. The influence of role models, too, is taken into account in composing the 'achievement press' variable; this is done by incorporating information on the educational and occupational attainments of family members and friends. Further exemplifying Davé's and Wolf's measurement procedures, the 'language model' variable is based on ratings of the parent's own language during the interview, including such language characteristics as richness and variety of vocabulary, fluency of expression, and the organization of thought as expressed through speech. This variable also comprises information on the parent's awareness of specific features of the child's use of language and on the nature of the parent's direct efforts to influence the child's language development.

Building on the work of Davé and Wolf, Henderson and Merritt (1968) demonstrated that the aforementioned kinds of environmental process variables can distinguish the families of Mexican American children who perform well on cognitive measures from those who do poorly. Henderson (1972) later showed that, for the same children, these environmental process variables predicted academic achievement over a three-year period. Specifically, Henderson and Merritt (1968) studied eighty Mexican American Spanish-speaking first-grade children in Tucson, Arizona. Two groups comprised the sample: half of the children were selected because of their very high scores on the Goodenough-Harris Drawing Test — a measure of general conceptual development — and the Van Alstyne Picture Vocabulary Test; the other half were chosen because of their very low scores. From individual interviews with the mothers, the researchers obtained ratings on thirty-three characteristics of the home that defined nine environmental process variables generally similar to those that Davé and Wolf had identified earlier. The analyses revealed significantly higher means on the environmental process variables for the group scoring higher on the cognitive tests. Thus, the processes taking place in the homes of the Mexican American children who scored high on these cognitive tests apparently differed in specific ways from the homes of those who scored low. It should be pointed out, too, that the analyses also revealed that the mothers of the high-scoring children had, on the average, more formal education and a higher socioeconomic status than did the mothers of the low-scoring children.

In a follow-up study, Henderson (1972) administered the California Reading Test to thirty-five children of the original Mexican American sample when they were in the third grade and correlated these third-grade reading achievement scores with the home environmental process measures obtained two years earlier.

Henderson (1972) reports a predictive bivariate correlation of .55 between the reading achievement scores and the combined score for the various home environmental process variables. This finding is congruent with that obtained by Wolf (cited in Henderson, 1981), who followed his aforementioned (non-Hispanic) sample over a four-year period and found that the multiple correlation between IQ at this time and the environmental process variables measured earlier was only slightly lower than the original, concurrent coefficient. These findings do not establish cause, but they do demonstrate reasonably long-term predictive stability for the measures of environmental processes in the home.

The approach that Davé (1963) and Wolf (1964) developed for the measurement of environmental processes in the home thus proved to be an exceptionally good predictor of intellectual performance, but the method is time consuming and requires the services of skilled interviewers. For this reason, Henderson, Bergan and Hurt (1972) set out to develop an interview schedule, adapted from Davé's (1963) and Wolf's (1964) method, that could be more easily administered and coded. The resulting instrument — the Henderson Environmental Learning Process Scale (HELPS) — is a structured questionnaire using a Likert-type response format. It is designed to provide measures of educationally relevant processes in the home that can be subject to change through intervention programs in the school and in the home. The items composing this instrument focus primarily on specific experiences provided for the child in the home and on patterns of interaction among family members, but they also tap parental attitudes and such factors as the parent's aspirations and expectations for the child. Although the information yielded by the HELPS is less detailed than that provided by focused interview procedures, it has the advantage of requiring less than twenty minutes to administer, and little training is required for its administration.

In order to assess the predictive validity and other psychometric properties of the measures obtained by the HELPS, Henderson *et al.* (1972) administered the Stanford Early Achievement Test and the Boehm Test of Basic Concepts to sixty low-income Mexican American and sixty-six middle-SES non-Hispanic White first-grade children in Tucson, and the HELPS to their mothers. The analyses in this study were performed on the combined ethnic sample. A principal-components analysis of the twenty-five HELPS items yielded five factors. The HELPS items loading on the first factor reflected opportunities taken by parents to expand their own and their child's social and intellectual interests and experiences. Specific items tapped such parental behaviors as having discussions with the child about programs viewed on television, seeking answers to the child's questions by consulting a book (in the child's presence), encouraging the child to read, and extending interpersonal contacts via participation in clubs or organizations and visits with friends in neighborhoods other than one's own. The second factor was characterized by the label, 'Valuing Language and School Related Behavior'. Specific parental behaviors identified by items loading on this factor included such interactions as explaining the sequence of steps for performing particular tasks, praising the child for approved behavior at school, and talking with the child at mealtimes. The third factor, labeled 'Intellectual Guidance', was defined by such items as helping the child with homework, pointing out features of intellectual interest during outings, and reading to the child during the preschool years. The items loading on Factor 4 appeared to involve attempts to

prepare the child to function well in school without attempting to duplicate directly the functions of a school teacher. Included here were opportunities to obtain school-related information through such community resources as libraries and museums, providing an intellectual atmosphere by modeling the use of printed materials, communicating verbally with the child, and being aware of specific features of the child's language development. The final factor, labeled 'Attention', reflected a variety of ways in which parents attend to behaviors that seem likely to stimulate intellectual development. Mothers who scored high on the items loading on this factor were likely to provide attention by showing interest in the child's learning and by calling attention to the child's use of language.

In order to ascertain whether the home environmental process variables as measured by the HELPS correlate with academic performance, Henderson *et al.* (1972) performed stepwise regressions (for the combined ethnic sample), using HELPS factor scores as predictors (concurrent) and the test scores as criteria. The results showed that together the HELPS factors accounted for the majority of the variance in cognitive test scores (e.g., a multiple *R* of .72 for the Boehm). The Henderson *et al.* (1972) HELPS is, then, a practical questionnaire that can be administered to large samples and scored with relative ease and that identifies variables reflecting environmental processes in the home that correlate highly with measures of children's academic achievement and conceptual development. The measure has demonstrated good qualities of reliability and predictive validity when adapted for use with varied populations in different community settings (e.g., Kitonyi, 1980; Prior, 1974; Valencia, Henderson and Rankin, 1985).

The HELPS was used in a study by Valencia and associates (1985) to assess the relative contributions of socioeconomic status, parental schooling level, home language, sibship size, and home environmental processes to the cognitive performance of Mexican American preschool enrollees from low-income, two-parent households. Multiple regression analyses revealed that the home environmental processes, as measured by the HELPS total score, accounted for more unique variance in performance on the General Cognitive Index of the McCarthy Scales of Children's Abilities than did any of these other variables. The next largest portion of unique variance in cognitive scores was explained (statistically) by a composite variable comprising parental schooling level and use of English over Spanish in the home. Finally, parental occupational status and sibship size did not add significantly to the prediction (concurrent) of cognitive scores. These findings provide support for Laosa's theoretical model (Laosa, 1982b; Marjoribanks, 1984), according to which parental schooling level exerts an indirect influence on children's developmental trajectories by affecting how parents interact with their children.

Another influential approach to the measurement of home environments was developed by Bettye Caldwell and her associates. Caldwell's Home Observation for Measurement of the Environment (HOME) Inventory has been used in numerous studies of the relation of home environments to the development of competence, and it has proven to be a good predictor of (non-Hispanic) children's intellectual performance (e.g., Bradley *et al.*, 1989; Bradley, Caldwell and Rock, 1988; Elardo, Bradley and Caldwell, 1977). This instrument is designed to assess the stimulation and support available to a child in the home environment. Information needed to score the Inventory is obtained through observation and

interview done in the home with the child and the child's primary caregiver (Caldwell and Bradley, 1984). As is the case with variables based on the measurement approach developed by Davé (1963) and Wolf (1964), the HOME Inventory has been found to be a more effective predictor of mental test performance than have global indices of SES (e.g., Bradley *et al.*, 1989). The HOME Inventory is not, however, an equally effective measure for all ethnic groups.

In one study (Elardo *et al.*, 1977), the predictions of intellectual performance at age 3 years from HOME scores obtained a year earlier held up for samples of both Black and non-Hispanic White families. Although intellectual performance scores were significantly associated with HOME scores in both ethnic groups, the relation was not as strong for Black as for non-Hispanic White families. The investigators speculated that the attenuated association between HOME and intellectual performance scores for Black families might have been the result of a range restriction in the intellectual performance scores for the Black sample or of a lower validity of HOME scores for Blacks than for non-Hispanic Whites. More recently, Bradley *et al.* (1989) examined the relationship between HOME scores and measures of children's intellectual development in Black, Mexican American, and non-Hispanic White samples; the samples were matched on HOME scores. Importantly, the results of this major study showed that, whereas the HOME scores significantly predicted intellectual performance for the non-Hispanic White and Black samples, the corresponding coefficients for the Mexican American sample were nonsignificant and near zero. These findings add support to Laosa's argument that there is a need to assess the measurement properties of data separately by ethnic group (Laosa, 1977b, 1982c). The findings also contribute to the growing evidence justifying Laosa's exhortations to practitioners and policymakers cautioning them against generalizing research results across different ethnic populations in the absence of supporting empirical evidence (Laosa, 1981b, 1988b, 1990).

In sum, studies of relations between home environmental processes and intellectual development show that measures of specific characteristics of home environments account for a statistically and educationally significant portion of the variance in children's intellectual performance, and that they provide stable predictions over time. With children of varied ages, and spanning a number of cultural groups and socioeconomic statuses, it has been shown that experiences and expectations in the family setting are associated with children's intellectual development. Measures of home environments can provide information of a specific nature about the actual experiences that differentiate between intellectually higher and lower performing children. At the same time, a small but growing number of studies underscore the need for caution in assuming — in the absence of appropriate evidence — that research findings obtained for a particular cultural population generalize to different ethnic groups.

The studies discussed thus far in this chapter offer correlational information and are therefore suggestive of — but not definitive about — causation. A few studies have been conducted to identify causal connections between home environment variables and intellectual performance, either by testing causal hypotheses using special statistical procedures (e.g., Bradley, Caldwell and Elardo, 1979; Laosa, 1982a) or by experimentally manipulating parenting behaviors. An example of the latter is a study by Henderson and Garcia (1973), discussed below.

Intervention Experiments

For obvious reasons, it is impossible to assign children randomly to different kinds of home environments at birth and observe the results. It is possible, however, to manipulate selected aspects of parental behavior on the basis of causal hypotheses derived from correlational findings. It then becomes possible to determine if the manipulated home practices influence the children's development in the predicted direction. This approach differs from large-scale parent training programs of the type that were popular in the 1970s (for reviews see Goodson and Hess, 1975; Haskins and Adams, 1983; Zigler and Weiss, 1985), because those intervention programs commonly manipulate several aspects of parental practice simultaneously, in ways that make it impossible to compare systematically the particular outcomes of specific practices. In contrast to such interventions with global objectives, a few studies have manipulated and assessed the effects of a narrow range of specific variables suggested by the research on family environments.

In one such study, Henderson and Garcia (1973) tested the hypothesis that parents can be trained to adopt the kinds of behavior that may facilitate their children's academic performance. Mexican American mothers of first-grade children in a low-income neighborhood in Tucson, Arizona were selected to participate in the experiment. Half of the mothers in a sample of sixty families were randomly assigned to the experimental group; the remainder served as controls and received no treatment. The mothers in the experimental group were trained by the experimenter to model, cue, and reinforce their children's inquiry skills — inquiry skills being defined as asking causal questions. These mothers received instruction in small groups, which consisted of participating in discussions of the rationale for the experiment, viewing demonstrations in which project staff modeled parent and child behavior, learning to code question-asking behavior, and engaging in role playing activities to learn techniques designed to promote their children's production of causal questions. Each mother participated in a total of five weekly sessions. Following each training session, the mother spent at least two brief (ten minute) periods with her child in the home, attempting to apply the procedures that she had learned during the training.

Before and after this intervention, data on the children's question-asking were collected for the experimental and control groups under three conditions, as follows. In the baseline condition, the experimenter showed the child a set of pictures and prompted him or her to ask questions about them. This was followed by an instructional condition, in which the experimenter used modeling procedures in an attempt to foster the child's tendency to ask causal questions. Immediately following this instructional session, the experimenter again measured the child's tendency to ask causal questions, using the same pictorial stimuli employed in the baseline condition. In the final data-collection condition, generalization was tested as the experimenter prompted the children to apply their question-asking skills to another, unfamiliar, set of pictorial stimuli. Henderson and Garcia's (1973) results showed that compared to the control group, the children whose mothers participated in the intervention displayed significantly superior performance on every one of these measures at posttest.

The differences in performance between the children in the two groups

resembled the differences one would expect to find between two groups differing in aptitudes for question-asking skills. That is, in the posttest data, not only did the performance of the children in the experimental group exceed that of the controls on the baseline condition, but also the performance improvement in response to the instruction condition was greater for the experimental children than for the controls. Moreover, this advantage was maintained during the generalization condition. These results, obtained with Mexican American families, have been replicated, with a slightly modified design, in a study with Papago families (Henderson and Swanson, 1974).

The relevance of the above findings by Henderson and Garcia (1973) is magnified when considered in light of Laosa's (1982b) theoretical model — which he supports with empirical data — regarding the use of questions as a teaching strategy by Chicano mothers with their own children. To illustrate the implications of their findings for education, Henderson and Garcia offer the following analogy. The experimental and control children, drawn randomly from a single population, appear in the posttests to represent two different populations: high achievers and low achievers on the specific tasks of the study. This difference, however, is not attributable to a corresponding difference in the aptitudes of the children. Rather, it is attributable to the fact that the experimental group of children received a particular kind of instruction and support at home, whereas the controls did not. This situation may be parallel to the natural circumstances in which children's school performance is facilitated by the types of interaction that take place in their homes.

Field experiments have demonstrated also that environmental processes modeled on those investigated in correlational studies of home environments can influence specific components of academic motivation. Swanson and Henderson (1976), for example, conducted such a study in response to a request from Papago parents. These parents were interested in learning to influence their children to become more interested in, and successful at, reading. Swanson and Henderson, therefore, designed a field experiment to test the hypothesis that children would choose activities of the sort that were reinforced through the overt approval or attention of a significant person in the home environment. Specifically, these investigators hypothesized that students whose mothers were trained in procedures to influence children's preferences for reading activities would (a) show an increase in their selection of reading materials over attractive alternatives, and (b) display generalization of this preference to the classroom. The participants in the experiment were families with a second-grader on the Papago Indian Reservation in Arizona. During a series of training sessions, the mothers in the experimental group were taught a series of behavior sequences for interacting with their children. After each session, they practiced at home, interacting in a warm, supportive way with their own children in situations focused on children's books, as follows. At designated intervals, the mother laid out reading materials, together with other toys and games that were attractive to children. She provided differential reinforcement by expressing her approval and engaging in affectionate interactions whenever her child approached and examined the reading materials; the mother merely continued her household routines when the child chose other materials.

Two different tests of the effects of the intervention were conducted. A

pre-post situational measure involved bringing each child to a room where materials were attractively displayed in three distinct interest areas; one containing books, one with puzzles, and one with various kinds of blocks. Observational records were kept of the amount of time the child spent engaged with each type of activity. Swanson and Henderson's (1976) analyses of these observations showed that the children in the experimental group displayed significant pre-to-post increases in the amount of time spent interacting with the reading materials, whereas the control group children did not. The second test was conducted in the regular classroom, to determine if treatment effects generalized beyond the situational tasks. Teachers set up a free choice situation in which children could select from a range of normal classroom activities. Observational data demonstrated that the experimental group children selected reading materials more often than did the control children, whose parents had not participated in the training or home intervention. We anticipate that findings such as these generalize to Chicanos, since the experimental procedures were based on data and theory on the nature of intellectually stimulating home environments, which available data suggest are applicable to Chicano families (e.g., Henderson *et al.*, 1972; Henderson and Merritt, 1968; Valencia *et al.*, 1985); moreover, the experimental manipulation was an extension and elaboration of a design that proved effective with Mexican American children (i.e., Henderson and Garcia, 1973; Swanson and Henderson, 1976). The results of the experiments reviewed in this section of the chapter show that parents can be trained effectively to teach specific intellectual skills to their children and to influence their motivation toward academic activities.

As we conclude this section, recall that in a previous section of the chapter we reviewed correlational research showing substantial and stable relationships between experiences provided naturalistically to children in the home environment and the children's intellectual performance. Field experiments such as those conducted by Henderson and his colleagues (Henderson and Garcia, 1973; Henderson and Swanson, 1974; Swanson and Henderson, 1976), on the other hand, are intended to examine the mechanisms hypothesized to mediate the relations identified in correlational studies. In this manner, field experiments can help illuminate the ways in which particular skills and motives acquired in the home environment interact with the demand characteristics of instructional settings.

Further insights into the nature of relations between the family environment and scholastic achievement can be gleaned from research on parental beliefs and expectations, to which we now turn.

Parental Beliefs, Mathematics Achievement, and Sex Differences

Some investigators are focusing their research on parental belief systems (e.g., Sigel, 1985). Among the questions being asked is whether parents' beliefs about their children's ability influence intellectual performance. Evidence is accumulating that parents' ideas about their children's ability may be a potent force in determining the children's ideas of themselves as academic performers (Alexander and Entwisle, 1988; Parsons, Adler and Kaczala, 1982; Phillips, 1987), and that children's ideas of themselves may, in turn, affect their achievement level (Stevenson and Newman, 1986). This influence may be especially salient in

mathematics, a domain in which parental belief systems are likely to influence children's self-concepts of ability and expectancies of success, their future achievement in this subject, and their course enrollment plans (Eccles, 1983).

Public concern about the school achievement of Chicanos has tended to focus largely on literacy and literacy-related skills, perhaps because of a general belief that the academic obstacles facing this ethnic group stem only from linguistic factors. Because the symbols and operations associated with mathematics are assumed to be common across languages, mathematics learning may receive less attention than other subjects. Whatever the cause for this neglect, the fact is that Chicano students are as much 'at risk' for low achievement or failure in mathematics as they are in other subjects (Durán, 1983; Educational Testing Service, 1989; Laosa, 1985; Sawyer, 1987).

Competence in mathematics is especially important for achievement in scientific and engineering fields and, increasingly so, for adequate functioning in other professions as well. Nevertheless, Mexican American pupils perform below norm in mathematics, as a group, and are less likely than the average student to enroll in mathematics courses (as they are in academic courses generally) that prepare them for college study toward these careers (Ramist and Arbeiter, 1986). The High School and Beyond study of high school sophomores and seniors is a valuable source of information on this point, because it included a sample of 4,016 Mexican Americans who were oversampled randomly from the general population of high school students. Analyses of these data by Nielsen and Fernandez (1981) revealed that Mexican Americans performed lower than non-Hispanic Whites in every achievement area that was assessed, including mathematics. Non-Hispanic Whites showed about a one standard deviation advantage over Mexican Americans in tested mathematics, reading, and vocabulary. Other relevant, and more recent, data come from college-bound seniors who take the Scholastic Aptitude Test (SAT) for college admissions, which is intended to measure developed ability in the use of language and in simple mathematics reasoning as might be expected of students in undergraduate college coursework. Analyses of SAT scores in 1989 reveal a sixty-five-point advantage for non-Hispanic Whites over Mexican Americans on the verbal section, and a sixty-one-point advantage in mathematics (Educational Testing Service, 1989) — these are differences of about two thirds of a standard deviation (Ramist and Arbeiter, 1986). The American College Testing Program (ACT) college-admissions test shows the same pattern of ethnic-group differences for first-year college students — non-Hispanic Whites outperform Mexican Americans by about one standard deviation on every ACT subtest (i.e., English, mathematics, natural sciences, and social studies; Sawyer, 1987). These various data sets likely underestimate the true achievement differences, because they exclude school dropouts — who are usually among the lowest achievers (Steinberg, Blinde and Chan, 1984) — and the dropout rate is higher for Mexican Americans than for non-Hispanic Whites (Orum, 1986; Rumberger, this volume).

Not only do Mexican American students as a group score lower than the norm on achievement tests of quantitative skills, but they also take fewer courses in mathematics than the average pupil; this is true even considering only seniors who seem to be planning to enter college (MacCorquodale, 1988; Ramist and Arbeiter, 1986). The relatively low participation of Mexican American students in advanced high school electives in mathematics is troublesome, because it

constitutes a pattern of choice that closes off options to participate in science-related occupations and in many of the social science or business college courses that require quantitative backgrounds as well.

Direct evidence on the nature of the processes that contribute to the observed poor achievement in mathematics and low participation in elective mathematics courses among Mexican Americans is scant, but one wonders whether studies of factors that contribute to sex differences in intellectual performance in other populations might yield some insights into the kinds of processes responsible for the ethnic group differences as well. The study of sex differences has a long history in psychology, and gender is a widely used variable in psychological research. Because most research with children involves both boys and girls, and investigators typically carry out at least perfunctory tests for sex differences, the body of research on sex differences is large (Jacklin, 1989). The earlier research comparing male and female performance averages on intellectual tasks showed sex differences in verbal, mathematical, and other abilities, but trend data point to a gradual narrowing or closing of these gaps during the last two decades (for a recent review of research see Wilder and Powell, 1989). The historical advantage of females in the verbal domain appears to have been virtually eliminated, and the superiority of males in certain mathematical areas seems less substantial now than in the past. A notable exception to this converging trend is in the upper ranges of tested mathematics performance, where the ratio of boys outscoring girls has remained fairly constant over the years (Feingold, 1988; see also Educational Testing Service, 1989). This sex difference emerges around the time of adolescence (cf. Laosa and Brophy, 1970, 1972; Wilder and Powell, 1989), as exemplified by the higher average scores of males than of females on the mathematics sections of college-admissions tests. Among high school seniors in 1989 (combined ethnic groups), the mean SAT mathematics score of males was forty-six points higher than that of females — a difference of more than one-third of a standard deviation — which contrasts with a sex difference of only thirteen points on the test's verbal section (Educational Testing Service, 1989). Course-taking patterns also differ by sex. Males take a greater number of advanced mathematics courses on the average than females, even in high school (Barton, 1989). Significantly, this pattern of sex differences in standardized test scores and in course-taking, which we see among non-Hispanic Whites, is also present among Mexican Americans, although Mexican Americans, whether male or female, score lower and take fewer math courses on the average than non-Hispanic Whites of either sex (MacCorquodale, 1988; Ramist and Arbeiter, 1986; Sawyer, 1987).

Several hypotheses have been advanced in attempts to explain the observed sex differences in mathematics performance and course participation (for reviews see Eccles and Hoffman, 1984; Wilder and Powell, 1989). Among these hypotheses is a plausible explanation that focuses on the cumulative effects of early socialization patterns and that implicates parents and teachers as expectancy socializers. A growing body of research is accumulating on the role of attitudes and expectations in creating or promoting sex differences in mathematical attainment, although these studies are largely on non-Hispanic samples. The existence of a sex difference in expectancy for success in mathematics and in self-concept of mathematical ability from middle childhood on is now well documented (Dossey, Mullis, Lindquist and Chambers, 1988; Eccles, 1985; Entwisle and Baker,

1983; Stevenson and Newman, 1986), but the developmental origins of this difference remain unclear. Eccles (formerly Parsons) and her colleagues argue that parents (Parsons, Adler and Kaczala, 1982) and teachers (Parsons, Kaczala and Meece, 1982) may be perpetuating, if not creating, these sex differences. These investigators designed a study to test the hypothesis that parents contribute to the sex differences in achievement expectancy and self-concept of mathematical ability through their beliefs about their children's abilities, the difficulty of math itself, and the importance of taking math courses (Parsons, Adler and Kaczala, 1982). The data provided confirmatory evidence for the hypothesis. The results showed that both mothers and fathers held sex-differentiated perceptions of their children's mathematics aptitude despite the similarity of the actual performance of boys and girls (non-Hispanic fifth to eleventh graders from middle- to upper-class homes). Parents of daughters believed their child had to work harder to do well in math than did parents of sons, whereas parents of sons thought advanced math was more important for their child than did parents of daughters. Moreover, parents' perceptions of and expectations for their children were related to the children's self- and task-perceptions. Similar results have been reported for younger children (Alexander and Entwisle, 1988; Entwisle and Baker, 1983). These findings point to the potential importance of parents' roles as expectancy socializers. Research further suggests that children's self-concepts of mathematical ability may, in turn, influence their actual performance (Stevenson and Newman, 1986). Other studies suggest a similar, though less substantial, influence by teachers (Eccles, 1983; Parsons, Kaczala and Meece, 1982). In sum, a number of studies suggest an influence on children's attitudes toward mathematics and hence on their mathematical attainment by parents' and teachers' gender-stereotyped beliefs and expectations. Such influences appear to be at the root of sex differences in mathematics attainment. These findings are based on non-Hispanic samples, and one may hypothesize similar processes for Mexican Americans; however, this remains an empirical question. It is for future research to ascertain whether or not the processes that account for sex differences in non-Hispanic Whites also explain the sex differences among Mexican Americans.

A different generalizability question is whether or not the processes that account for sex differences also explain the ethnic group differences. Berryman's (1983) study suggests a negative answer. She studied the causes of representation of women and of certain ethnic groups — including Chicanos — among holders of BA, MA, and PhD degrees in the quantitatively based disciplines. Berryman's analyses suggest 'fundamentally different causes of women's and minorities' underrepresentation' among recipients of quantitative degrees. For women, the causes 'seem to be the familiar motivational factors that shift girls' interests away from the sex atypical careers and the high school mathematical sequence associated with quantitative postsecondary training'. For Chicanos, on the other hand, 'the major factors seem to be family socioeconomic status, especially parental education, with its: (1) . . . effects on educational aspirations and high school mathematical and science achievements, and (2) . . . effects on career information and career preferences' (1983, pp. 105–6). Berryman's findings seem consistent with MacCorquodale's (1988) hypotheses regarding parental influences on Mexican American children's mathematics achievement and general educational attainment. Also germane to the issue of generalizability are the findings of a number of studies suggesting that teachers respond more to a student's racial and

ethnic characteristics and socioeconomic status than to gender and that teachers alter their expectations of student achievement accordingly (for a review of research see Dusek and Joseph, 1983).

In an attempt to uncover the determinants of school success among Chicanas, Gándara (1982) interviewed seventeen Chicanas and twenty-eight Chicanos who had attained the PhD, MD, or JD degree. Gándara reasoned that much of the research on Chicanos has focused on low academic achievement, thus yielding numerous hypotheses about educational failure but contributing few insights into the processes associated with success; therefore, knowledge of the kinds of family experience that contribute to success would be especially important.

The high-achieving Chicanas studied by Gándara reported that their mothers played an especially important role in fostering their motivation to achieve academically. Contrary to Gándara's predictions, the majority of the women in the study reported that their mothers had influenced their educational aspirations and attainment at least as much as had their fathers; this was true also of the men. Further, most of these high-achieving Chicanas and Chicanos described their parents as nonauthoritarian in discipline styles and as placing emphasis on independent behavior. Indeed, one of the surprising results was how similarly parents had treated the males and females in the sample. This finding, too, is contrary to the widely held stereotype of male authoritarianism and female submission in families of Mexican descent. Even though most of them had received strong support from their families, particularly their mothers, about 25 per cent of the women reported they did not know what educational aspirations their parents held for them; in contrast, the men generally felt that parental aspirations had been conveyed clearly to them. It is also worth noting that whereas Chicanos tended to credit their own inner strength and abilities for their educational successes, Chicanas most often attributed their accomplishments to the support of their families. Finally, it is also significant that at the age when most Chicanas have married and begun to take on new familial roles, all the high-achieving Chicanas studied by Gándara remained unmarried and childless; there were no marriage or parenthood responsibilities that might have impeded their educational attainment.

Consistent with Gándara's findings, a survey by Chacón, Cohen, and Strover (1986) revealed a high degree of parental support for attending college among both male and female Mexican American college students. These researchers administered mail questionnaires to 508 women and 160 men of Mexican descent enrolled in five California colleges. Over 60 per cent of each sex sample rated their parents as very supportive of their attending college, and only a small fraction reported any kind of parental opposition. Also consistent with Gándara's data, both the men and the women in the Chacón *et al.* study reported at least as much support for college attendance from their mothers as from their fathers. Although the degree of parental support was thus good for both sexes, slightly more college men than women rated their parents as very supportive.

Of the various components of socioeconomic status, the level of formal education attained by parents was identified earlier in this chapter as a significant factor associated with their children's intellectual development. The parents' educational aspirations and expectations for their children, too, have been found to be associated with the parents' own educational level (Laosa, 1982b). These

three variables may be especially influential in regard to children's development in quantitative-related areas (e.g., Berryman, 1983; Marjoribanks, 1979). For example, Berryman (1983) points to parental education level as a major influence on Chicano students' curricular choices. Berryman's analyses showed that Chicanos were indeed generally underrepresented in college mathematics, science, and engineering courses, but those Chicanos with a college-educated parent were almost as well represented in these courses as non-Hispanic Whites — in contrast to the pattern for Chicanos who were the first in their families to attend college.

In sum, research on the socialization processes influencing Chicanos' achievement in mathematics or their participation in this subject is scant. It does seem clear, however, that the level of formal education attained by parents constitutes an important influence on their attitudes toward and expectations for their children's participation and performance in mathematics. At the same time, the literature on sex differences in other ethnic populations indicates that women's relatively low participation and achievement in mathematics is related to the expectations and perceptions that their parents held about the women's early mathematical ability, with parents of girls generally expressing lower expectations and making lower ability estimates than those of boys. Beyond the importance of this knowledge in its own right, it has been suggested that an awareness of the research on the processes that affect the participation and achievement of women in mathematics and quantitative-related fields might contribute to our understanding of the kinds of influences involved in opening or closing avenues of opportunity for Chicano students. Although they do have an intuitive appeal, we strongly caution against making such generalizations, given the research evidence (e.g., Berryman, 1983) suggesting that the variables and mechanisms accounting for sex differences are fundamentally different from those determining ethnic group inequalities.

Concluding Comments

The focus of this chapter is primarily on the innermost level in Bronfenbrenner's (1979, 1988) four-level conception of the human environmental ecology, namely, the microsystem — and, more specifically, the child's socialization in the family. We reviewed and discussed selected research studies attempting to illuminate various factors within the family setting that may influence Chicano children's academic development. In addition to the family, the microsystem contains settings that, too, can be important socializers and determinants of academic development — including the school itself, the peer group, and the media. Similarly, the other levels of the environmental ecology — the mesosystem, the exosystem, and the macrosystem — exert their own important, although indirect, influences on the child. These other socialization settings and ecological levels must be examined along with the family in any attempt at a comprehensive analysis of Chicano children's academic development — if such a task were possible. The point is that the family is important, but the other settings and levels of the human ecology should not be ignored.

Indeed, the results of the research reviewed and discussed in this chapter implicate all four levels of Bronfenbrenner's ecological system. As an illustration,

consider Laosa's research on maternal teaching strategies. It will be recalled that Laosa (1978, 1980a, 1982b) conducted direct observations of Chicana mothers in their homes while they taught their own children. Among Laosa's findings was a substantial relationship between the kinds of teaching strategy employed by the mothers and the number of years of formal schooling that they themselves had attained. Although correlational, these data suggest that a mother's choice of strategies for teaching her children in the home is determined by the mother's own schooling level. Laosa's data revealed that the higher a mother's schooling level, the more her teaching strategies resemble those that one generally expects to find in school classrooms, thereby likely facilitating her child's adaptation to school. This finding thus implicates all four levels of Bronfenbrenner's ecological framework in the academic development of Chicanos, as follows. The mother's years of schooling correspond to an *exosystem* variable; that is to say, the events that in the past the mother had herself experienced as a student in school are now indirectly affecting her child's immediate environment, or *microsystem*. Further, the findings bearing on home-school similarities in teaching strategies suggest a *mesosystem* relation between home and school.

Finally, any policy implications that one might draw from these findings point to *macrosystem* considerations. On the level of Bronfenbrenner's macrosystem belong a society's policies. Many aspects of the present-day social and educational inequalities affecting Chicanos can be understood only in light of the caste-like structures that have evolved out of the earliest contacts and interrelationships between this population and other US ethnic groups (Carter and Segura, 1979; Laosa, 1984b). As Bronfenbrenner (1979, 1988) reminds us, the macrosystem can be altered through policy change, with the result that there will be change bearing on the society's exosystem, mesosystem, and microsystem structures.

The study of Chicano children's socialization is still in its infancy — so much so that no attempt is made here to list the myriad research questions that need to be addressed in future research. Many of these questions are raised, however, throughout the chapter — implicitly or explicitly. As shown here, the research literature has moved some distance — both empirically and theoretically — toward specifying the variables and mechanisms in the socialization process that seem to mediate, at least partly, Chicano children's intellectual development and academic attainment; but much remains to be done. We require more studies that illuminate how the socialization process interacts with other levels of the environmental ecology to create and maintain patterns of ethnic group differences in academic learning, scholastic motivation, and movement through the schooling process. It is hoped that this chapter will point researchers in interesting directions toward work that further specifies these mechanisms and that traces their precise effects on Chicano children's academic development.

A large proportion of the academic achievement effects of ethnic group membership appears to be transmitted by mechanisms that in principle are susceptible to control by educators and policy makers. By broadening and deepening our understanding of the nature and action of these mechanisms, research programs such as those reviewed in this chapter can increase our capacity 'to make wise, effective policy in pursuit of an equitable distribution of life chances' (Bidwell and Friedkin, 1988, p. 468).

Notes

1 In this chapter, we interchangeably use the terms *Chicano* and *Mexican American* to refer to persons of Mexican origin or descent in the United States. In the Spanish language, *Chicana* corresponds to a female referent, and *Chicano*, the male; *Chicano* is also the appropriate term for the gender aggregate. In describing and discussing particular studies, we generally use the terms chosen by their authors in reference to their respective samples.

2 The difference in factorial structure between Laosa's (1984a) and the Valencia *et al.* (1981) data is likely the result of the difference in the sampling designs of the two studies.

3 Only a very small proportion of families are headed by a man with no wife present: as counted in the 1980 US census, only 3.1 per cent of the Mexican-origin families with own children under 18 years of age were headed by a man with no wife present (Laosa, 1988a).

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